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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
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10/092,305

03/07/2002

Toshihiro Ohtani

1344.1086

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7590

02/25/2005

STAAS & HALSEY LLP
SUITE 700
1201 NEW YORK AVENUE, N.W.
WASHINGTON, DC 20005

EXAMINER

WANG, QUAN ZHEN

ART UNIT

PAPER NUMBER

2633

DATE MAILED: 02/25/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary

Application No.

10/092,305

Applicant(s)

OHTANI, TOSHIHIRO

Examiner

Quan-Zhen Wang

Art Unit

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

- 1) ☒ Responsive to communication(s) filed on 07 March 2002.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

- 4) ☒ Claim(s) 1-16 is/are pending in the application.
- 4a) Of the above claim(s) _____ is/are withdrawn from consideration.
- 5) ☐ Claim(s) _____ is/are allowed.
- 6) ☒ Claim(s) 1-16 is/are rejected.
- 7) ☐ Claim(s) _____ is/are objected to.
- 8) ☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on _____ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All b) ☐ Some * c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
 - ☐ Certified copies of the priority documents have been received in Application No. _____.
 - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

- 1) ☒ Notice of References Cited (PTO-892)
- 2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
- 3) ☒ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)
Paper No(s)/Mail Date 3/7/02.
- 4) ☐ Interview Summary (PTO-413)
Paper No(s)/Mail Date. _____.
- 5) ☐ Notice of Informal Patent Application (PTO-152)
- 6) ☐ Other: _____.

DETAILED ACTION

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

1. Claims 1-5, 8-11, and 14 are rejected under 35 U.S.C. 102(b) as being anticipated by Okamura (JP07-199244 A).

Regarding claims 3 and 1, Okamura teaches a noise light elimination apparatus and method (fig. 2, Section 20) for eliminating noise light components (paragraph 0019, "wave form distortion") contained in a signal light, comprising: a stimulated Brillouin scattering generating medium (fig. 2, Fiber Cable 6) that generates a return light due to stimulated Brillouin scattering when a light having a power exceeding a threshold value is input (paragraph 0018); an optical amplifying section (fig. 2, Amplifier 4) that amplifies a signal light up to a power exceeding the threshold value; and an optical input/output section (fig. 2, Branching Section 5) that applies the signal light amplified by the optical amplifying section to the stimulated Brillouin scattering generating medium, and extracts ("separate at the branching section 5", paragraph 0019) the return light generated by the stimulated Brillouin scattering generating medium as the signal light (paragraph 0019), to thereby eliminate the noise light components contained in the signal light.

Regarding claims 2, 4, and 5, Okamura teaches that the apparatus further comprising an adjusting section (fig. 2, Amplifier 7) that adjusts a power of the return light generated by the stimulated Brillouin scattering generation medium, and the adjusting section includes an optical amplifier (fig. 2, Amplifier 7) that amplified the return light (paragraph 0019).

Regarding claims 8-10, Okamura further teaches that the stimulated Brillouin scattering generating medium is provided in a form of an optical transmission path, optical fiber, and optical waveguide (fig. 2, Fiber Cable 6; paragraph 0018).

Regarding claim 11, Okamura further teaches that the other end of the stimulated Brillouin scattering generating medium positioned on an opposite side to one end to which the signal light amplified by the optical amplifying section is input, is subjected to non-reflection termination treatment (paragraph 0021).

Regarding claim 14, Okamura teaches an optical transmission system (fig. 2) for amplifying a signal light sent from an optical transmission device (fig. 2, station 1) to an optical transmission path, by optical repeaters (fig. 2, Amplifiers 11 and 12) arranged on the optical transmission path, to repeating transmit the signal light to an optical receiving device (fig. 2, station 10), comprising; at least one of the noise light elimination apparatus (fig. 2, Compensation Device.21) recited in claim 3 on the optical transmission path (fig. 2, the optical transmission path from transmitter 1 to receiver 10).

Claim Rejections - 35 USC § 103

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

2. Claims 6-7 and 12 are rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura (JP07-199244 A) in view of Sugaya et al. (U.S. Patent Application Publication US 2001/0017729 A1).

Regarding claim 6, Okamura has been discussed above in regard to claims 3 and 4. Okamura differs from the claimed invention in that Okamura does not specifically teach that the adjusting section includes an optical attenuator that attenuates the return light. However, it is well known in the art that an optical attenuator is widely used to attenuate optical signals to a desired level. For example, Sugaya discloses an optical attenuator (fig. 3, Attenuator 64) to attenuate optical signals to a desired level (paragraph 0068). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use an optical attenuator, such as the one disclosed by Sugaya, in the apparatus of Okamura in order to adjust the return light to a desired level.

Regarding claim 7, Okamura has been discussed above in regard to claims 3 and 4. Okamura differs from the claimed invention in that Okamura does not specifically teach that the apparatus further comprising a detection section that detects a power of the return light output from the adjusting section; and a control section that controls an operation of the adjusting section based on a detection result of the

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detection section. However, it is well known in the art to detect a power level of an optical signal and control an operation based on the detection result. For example, Sugaya teaches an optical adjusting apparatus (fig. 3, Part 1000) which detects the power level of the optical signal (fig. 3, splitter 54 and PD 58) and control an operation (the optical amplification) (fig. 3, Automatic Gain Control Circuit 60) based on the detection result. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to incorporate an optical adjusting apparatus which detects the power level of the optical signal and control an operation based on the detection result, such as the one taught by Sugaya, in the apparatus of Okamura in order to adjust the signal level of the return light to a desired level.

Regarding claim 12, Okamura has been discussed above in regard to claims 1 and 3. Okamura further teaches that the noise light elimination apparatus further comprises an optical coupler having three ports (fig. 2, branching section 5; paragraph 0019), and the signal light amplified by the optical amplifier is input to a first port of the optical coupler and output from a second port of the optical coupler to the stimulated Brillouin scattering generation medium, and the return light generated by the stimulated Brillouin scattering generation medium is input to the second port of the optical coupler (fig. 2, branching section 5) and branched into two (fig. 2, first port: from 5 to 4, and third port: from 5 to 7) to be output from the first port and a third port. Okamura differs from the claimed invention in that Okamura does not specifically teach an optical isolator to block the return light output from the first port of the optical coupler to the optical amplifying section. However, it is well known in the art to use an isolator to block optical

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signals from traveling backwards. For example, Sugaya teaches to use optical isolator (fig. 3, Isolator 55) to block backward traveling light along the optical fiber. Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use an isolator, as it is taught by Sugaya, in the apparatus of Okamura in order to block the return light generated by stimulated Brillouin scattering back to the signal amplifier.

3. Claim 13 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura (JP07-199244 A) in view of Johnson et al. (U.S. Patent Application Publication US 2002/0131104 A1).

Regarding claim 13, Okamura has been discussed above in regard to claims 3 and 4. Okamura differs from the claimed invention in that Okamura does not specifically teach that the optical input/output section includes an optical circulator arranged between an optical output end of the optical amplifying section and an optical input end of the stimulated Brillouin scattering generating medium. However, it is well known in the art to use an optical circulator to replace a 3-port coupler for certain applications. For example, Johnson teaches to use optical circulator to replace 1X2 couplers 44 and 46 in Fig. 4 (paragraph 0057). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use an optical circulator, as it is taught by Johnson, in the apparatus of Okamura in order to reduce effects of reflections back to the optical signal amplifier.

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4. Claim 15 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura (JP07-199244 A) in view of Kai et al. (U.S. Patent US 6,462,844 B1).

Regarding claim 15, Okamura has been discussed above in regard to claims 1, 3, and 14. Okamura differs from the claimed invention in that Okamura does not specifically teach that the optical receiving device includes a demultiplexer that demultiplexes the signal light transmitted on the optical transmission path, in accordance with a wavelength thereof, and the demultiplexer has filter characteristics where a center wavelength of a transmission band is set in accordance with a wavelength shift amount due to stimulated Brillouin scattering occurring in the noise light elimination apparatus. However, it is well known in the art to use a demultiplexer having filter characteristics with a center wavelength of transmission band is set in accordance with the signals to demultiplex optical signals at a receiving device. For example, Kai teaches an optical receiving device (fig. 1, optical receiving apparatus 3) which includes a demultiplexer (fig 1, CPL 31 and AOTF 32-1 to 32-n) that demultiplexes the signal light transmitted on the optical transmission path, and the demultiplexer has filter characteristics (fig. 1, AOTF 32-1 to 32-n) where a center wavelength of a transmission band can be set in accordance with the signal wavelength (column 11, lines 5-15). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to use an optical receiving device which includes a demultiplexer, such as the one taught by kai, to replace the receiving device of Okamura in order to receive signals at multiple wavelengths.

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5. Claim 16 is rejected under 35 U.S.C. 103(a) as being unpatentable over Okamura (JP07-199244 A) in view of Kai et al. (U.S. Patent US 6,462,844 B1) and further in view of Uetsuka et al. (U.S. Patent US 6,549,696 B1).

Regarding claim 16, the modified system by Okamura and Kai differs from the claimed invention in that Okamura and Kai do not specifically teach that the demultiplexer includes an arrayed wave guide grating capable of adjusting the filter characteristics. However, it is well known in the art that an arrayed wave guide grating can be used for demultiplexer and is capable of adjusting the filter characteristics. For example, Uetsuka teaches an AWG type optical demultiplexer (figs. 10, 13, and 14) which inherently having filter characteristics and the center wavelength can be accurately set (column 19, lines 22-32). Therefore, it would have been obvious for one of ordinary skill in the art at the time when the invention was made to apply an arrayed wave guide grating based demultiplexer, such as the one taught by Uetsuka, for the demultiplexer in the modified apparatus of Okamura and Kai in order to reduce the insertion loss of the demultiplexer and the channel cross-talk at the receiver.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Quan-Zhen Wang whose telephone number is (571) 272-3114. The examiner can normally be reached on 9:00 AM - 5:00 PM, Monday - Friday.

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If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Jason Chan can be reached on (571) 272-3022. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).


M. R. SEDIGHIAN
PRIMARY EXAMINER

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